Intra Abdominal Complications Of V-P Shunts

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Abstract : The authors report two cases of rarely seen intra abdominal complications of ventriculo-peritoneal shunts (extrusion of abdominal catheter into the scrotum and intestinal perforation). In each case, the treatment is outlined.

Key words: Cerebrospinal fluid shunt, Hydrocephalus, Intestinal perforation, Scrotum

INTRODUCTION

Intra abdominal complications after shunting are not uncommon. The incidence has decreased following improvements in operative technique and shunt tubing (4,5), but they still occur with a frequency as high as 30% (1). Extrusion of the shunt tubing into the scrotum and intestinal perforation have been previously-reported complications (1,2,4-6,9-16). We report these two unusual complications to draw attention to the fact that they still may occur although modern techniques and tubing have been developed.

CASE REPORTS

Case 1: A 6-month-old boy was admitted to the Department of Child Health and Diseases in Dokuz Eylül University Hospital to investigate a febrile convulsion on September 20th, 1988. Bacterial meningitis was diagnosed and treated with penicillin and cefotaxime. Although fever and meningeal signs subsided over a few days, during the next fifteen days, the patient's head circumference gradually increased to 45 centimetres and the anterior fontanelle became tense. Ultrasonography revealed communicating hydrocephalus. Lumbar puncture was repeated at two-day intervals. As the cerebrospinal fluid findings normalized, cranial computed tomography (CT) was obtained. Because the hydrocephalus had not subsided, a ventriculo-peritoneal shunt was placed. The peritoneal catheter was inserted under direct vision.

Six months later the mother saw shunt tubing extruding from her child's anus, and returned with the patient, who was asymptomatic and was readmitted for observation. There were no signs of meningitis or peritonitis. The head circumference was 48 cm and the CT showed normal ventricles. Five days later, the shunt tubing passed in the stool (Fig 1A-B). Since the peritoneal catheter had become disconnected from the flushing part, the nonfunctioning proximal shunt apparatus was removed. On follow-up the ventricles and head circumference remained unchanged and the diagnosis was changed to arrested hydrocephalus.

Case 2: A 21-day-old boy was diagnosed by CT appearance as having communicating hydrocephalus. A ventriculo-peritoneal shunt was inserted on July 18th, 1989. During the immediate postoperative period, the fontanelle became soft, and the head circumference subsequently decreased from 44 to 42 cm. On the third postoperative day, swelling in the scrotum was seen, and a direct abdomen X-ray

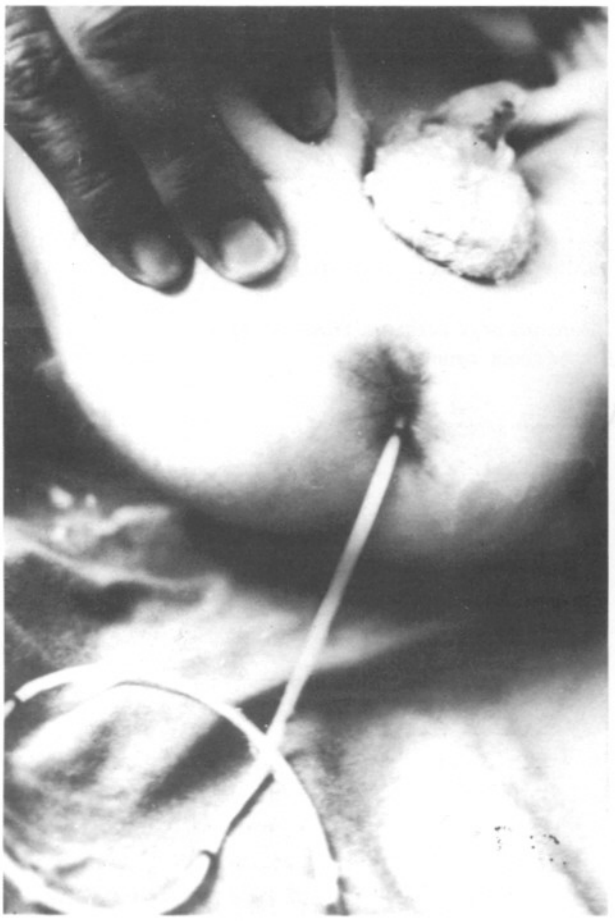
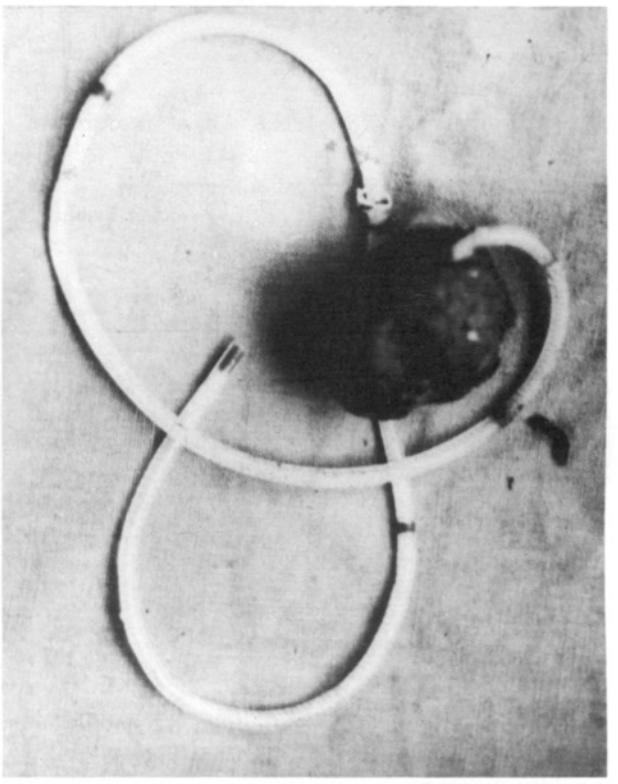


Fig. 1 A : Shunt tubing extruding from the anus



1 B : Delivered shunt tubing in faecal material

revealed that the shunt tubing had herniated into the scrotum (Fig 2A). The child underwent reoperation the same day. The shunt tubing was shortened (Fig 2B) and the patent processus vaginalis was obliterated. On follow-up examination six months later, the patient was well and the shunt was functioning.

DISCUSSION

Although ventriculo-peritoneal shunt placement became a popular operation after the advent of silastic catheters, several reports of abdominal complications have since then begun to appear in the literature. These include cerebrospinal fluid cyst, inguinal hernia, hydrocele, ascites, ileus, peritoneal infection, volvulus, non-enteric viscous perforations (urinary bladder, gallbladder, vagina, scrotum) and intestinal perforation (1,2,3,5,7,10,11,14,16). Rowe et al. (13) documented the patency of the processus vaginalis in children , and found that in the first three months of life, it is patent in 63% of infants and obliteration occurs gradually. Increased intra abdominal pressure due to accumulation of cerebrospinal fluid could increase the incidence of hernia or hydrocele. Murtagh and Lehman (8) reported two cases of hydrocele in fifty-three patients undergoing V-P shunts. Grosfeld et al. (5) reported a higher incidence of inguinal hernia following V-P shunts (16% in patients with V-P shunts; 1.2% in children with ventriculo-atrial shunts). Besides these indirect complications associated with increased intra abdominal pressure, direct complications due to herniation of the peritoneal shunt tube into the scrotum through an unobliterated processus vaginalis have been reported (2,11). In our case, the distal end of the shunt tubing was within the scrotum and would have eventually caused a hydrocele if the diagnosis had been delayed. To avoid this complication, the length of the shunt catheter lying within the

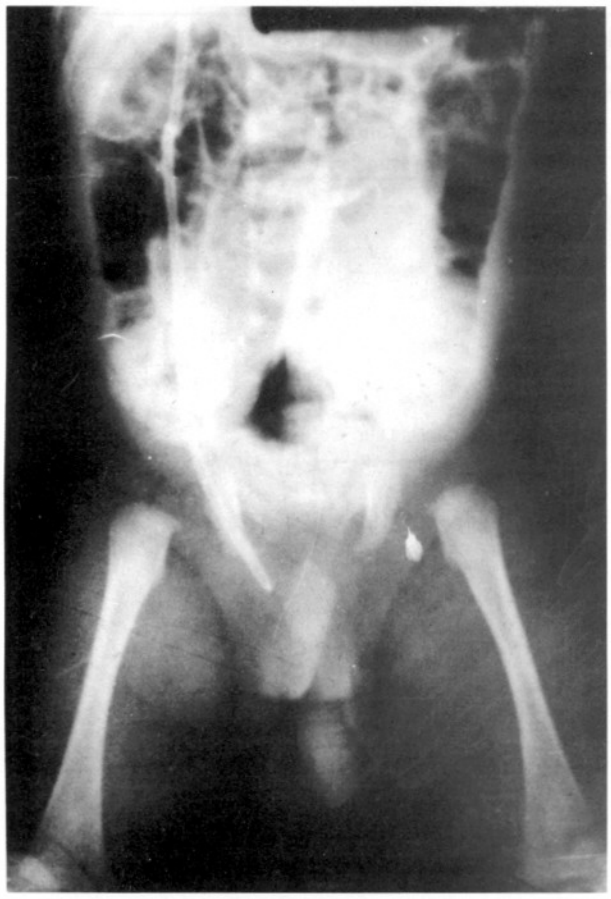


Fig. 2 A : Direct abdomen x–ray showing the distal tubing extruding into the scrotum

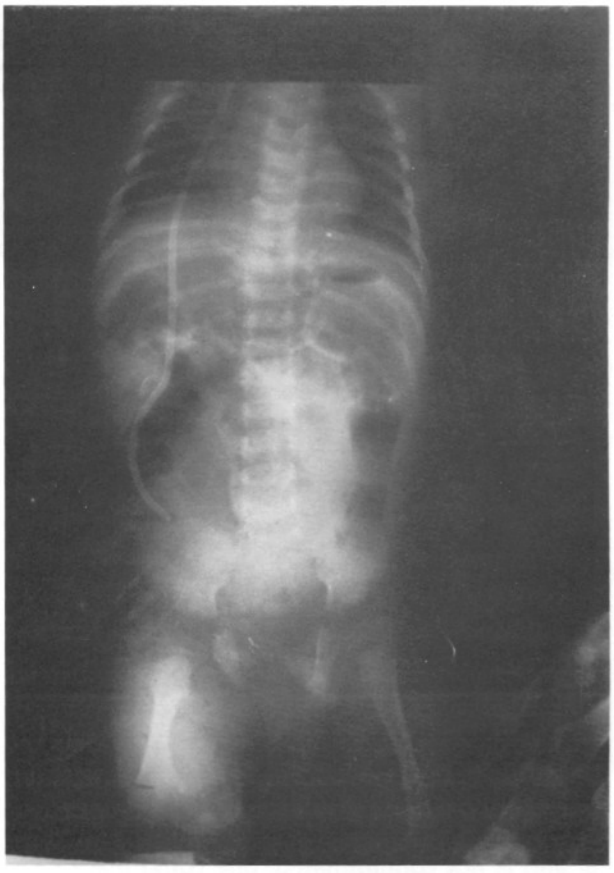


Fig. 2 B : After operation, shortened tubing is seen

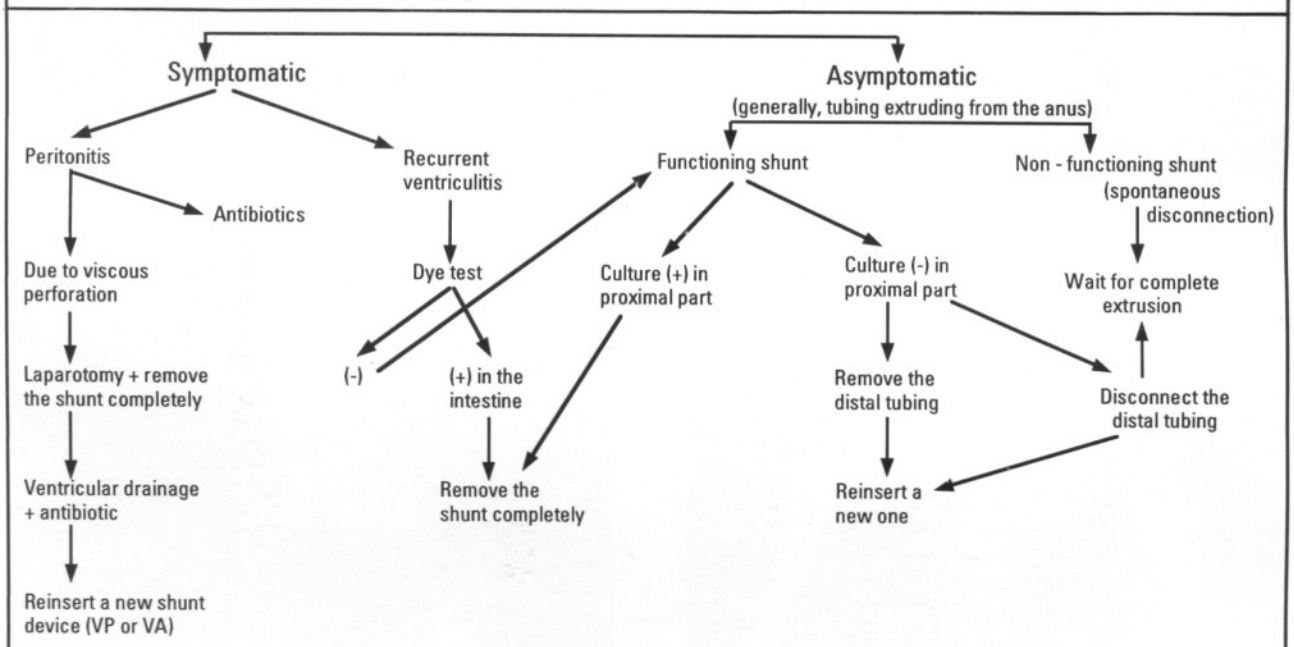
peritoneal cavity should not reach the inguinal area even though it is placed over the dome of the liver. To treat this problem, the peritoneal catheter is shortened by means of the connector in the upper abdominal surface, if the distal part is longer than 15 cm and then the neck of the hernia sac is repaired via an inguinal incision.

Intestinal perforation by a V-P shunt catheter was first described by Wilson and Bertan in 1966 (16). Hornig and Shillito (6), in their recent review article, reported that 42 intestinal perforations including their own cases have been found in the literature up to then. The low incidence of peritoneal infections has been explained by the fibrous encasement of the catheter at the enterotomy site (15,16). Factors thought to predispose to perforation include: intra abdominal adhesions, inflammatory changes within the peritoneum, technique of placement of the distal catheter into the peritoneum (with the use of a trocar vs. under direct vision), the length of the catheter and the type of distal tubing (with or without spring wire). Also, the abdominal trocar technique may cause direct perforation especially in the presence of adhesions (4,6). The exact mechanism of this perforation is still unknown however. Although peritonitis has not been seen frequently, retrograde ventriculitis (whether the shunt is functioning or not) has become the most important complication (causing infection in 58% of functioning shunts and in 33% of nonfunctioning shunts) (6).

Rekate et al. (12) discussed the pitfalls of management of patients with an acute abdomen and V-P shunt. A treatment algorithm dealing with intestinal perforation according to related literature is summarized in Table 1 (1,4,5,6,14).

If the patient is asymptomatic, an extensive intra abdominal operation is not required; the distal piece of the tubing is disconnected from the ventricular portion through a small upper abdominal incision. If the proximal part of the shunt tubing is contaminated, prompt removal and appropriate

Table 1 : Treatment Algorithm In Intestinal Perforation Due To-V-P Shunts



antibiotic therapy is advised. If the shunt is functioning and is not contaminated, one could place new peritoneal tubing through another abdominal incision. If the shunt tubing protrudes from the anus as seen in our case, the disconnected peritoneal catheter is gradually extruded during a bowel movement and delivered with the faecal material and exploration is not required.

If the patient has peritoneal signs secondary to perforation of a viscous, laparatomy is mandatory.

V-P shunt placement has become a popular operation-it is a simple procedure and performed safely even in infancy. But, serious complications have been seen (1,4,6). For this reason, we need to give further attention to the initial shunting procedure and develop techniques to reduce at least some of these complications.

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